*PRESS BULLETIN 486* *February, 1936*
(A Revision of Press Bulletin 449)

UNIVERSITY OF FLORIDA
AGRICULTURAL EXPERIMENT STATION
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IMPERIAL MYCOLOGICAL INSTITUTE
29 APR. 1936

# POWDERY MILDEW OF ROSES

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Powdery mildew is a serious disease of certain varieties of roses, and when discovered in a planting, measures must be taken immediately to check its further spread. Few rose gardens containing mixed varieties remain free of the disease for any great length of time. Varieties differ greatly in resistance to the disease, although nearly all roses, including the wild roses, Hybrid Teas, Hybrid Perpetuals, and Climbers are more or less susceptible. The Dorothy Perkins and Crimson Rambler varieties are particularly subject to this disease, while the following are mildew-resisting: TEAS, Maman Cochet and Alexander Hill Gray; HYBRID TEAS, Antoine Rivoire and Joseph Hill; POLYANTHA, Cecile Brunner; and CLIMBERS, American Pillar and Dr. Van Fleet. This disease is more likely to appear in epidemic form during the spring or fall than during the summer months.

## CAUSE

Two powdery mildew fungi attack roses, although one of these* is generally considered the most frequent cause of the disease. In the presence of sufficient moisture, spores present on the leaves, stems or blossoms germinate, and the growth therefrom soon results in a network of slender branching threads over the surface. Certain branches of the fungus penetrate into the host tissue and absorb nourishment to sustain themselves. The attacked cells swell at first, causing distortion of the affected parts, and soon die. In addition, upright branches are produced which bud off countless numbers of white, oval-shaped spores. The accumulation of these vegetative parts and spores of the fungus on the surface of the plant causes the whitish powdery appearance from which the disease derives its name. After a destructive vegetative period, the fungus sometimes forms a second type of fruiting structure which, when mature and abundant, appears as tiny, black dots scattered over the network of threads. Within these black fruiting bodies are produced a second type of spore which is more resistant to cold and other environmental conditions unfavorable to the fungus. However, because of the moderate temperatures in this State, the fungus may winter over in either stage of development. The fact that the greater portion of the powdery mildew fungus is on the out-

* *Sphaerotheca pannosa* (Wallr.) Lev.

side of the leaves and stems rather than on the inside makes it vulnerable to suitable spray and dust applications.

### SYMPTOMS

The disease first appears as grayish or whitish spots on young leaves and shoots. These spots become raised and blister-like, particularly on the younger tissues. Under humid and poorly ventilated conditions the disease develops rapidly, and soon the leaves, young stems, thorns, and buds become more or less covered with the white, powdery growth of the invading fungus. Frequently, young leafy shoots or other parts of the plant become completely coated. Portions of infected plants or at times entire plants appear as though they were dusted with some white powder. Dwarfing, curling, and other malformations of leaves, stems, and buds develop, and soon the infected tissues become parched and brown. In advanced stages of the disease the white, mildewed appearance becomes less conspicuous or entirely lost. While defoliation and other injuries caused may weaken the plants seriously, death seldom results immediately.

### CONTROL

Good ventilation is important in the prevention of powdery mildew. Plants pruned to an open type of growth, well-spaced, and set away from walls or buildings dry quickly and are less affected. Since rose varieties differ greatly in susceptibility to the disease, the less susceptible varieties should be selected whenever practicable.

Because the powdery mildew fungus lives almost entirely on the outside of the host tissues, it may be eradicated from diseased parts after once becoming established. Immediately upon discovery, the diseased bush, as well as all bushes situated nearby, should be completely covered with a suitable fungicide. Additional applications should be made at weekly intervals until all traces of the disease have disappeared, although two or three applications are usually sufficient.

Sulphur fungicides have proved particularly effective in combatting this disease. If either the sulphurs or coppers have been applied regularly to control other diseases, powdery mildew is not likely to appear. Many suitable sulphurs are available for application either as dusts or sprays. The dusts are generally more satisfactory, and for effectiveness as well as ease in making light, thorough applications they should be mostly of 300-mesh fineness. They may be obtained either with or without arsenicals or nicotine added and in either the yellow or green-colored forms. Difficulty in applying dusts on windy days may sometimes be overcome by applying either early or late in the day. The list of effective sprays would include the wettable sulphurs (strength as recommended by the manufacturers), lime-sulphur (8 ounces per 5 gallons water), and potassium sulphide (1 ounce per 3 gallons water). Since sulphur sprays and dusts sometimes cause severe foliage injury during hot weather, they should be used with caution during the summer months. Applications made late or early in the day would be less likely to result in injury. The foliage may be either wet or dry, although dry foliage permits better coverage with dusts.